IN THE UNITED STATES PATENT AND
TRADEMARK OFFICE

Art Unit : 1742
Examiner : Sikyin Ip
Serial No. : 10/644,217
Docket No. : 03-542
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Inventors : Yoshinori Yamagishi
: Shu-xin Dong
Title : COPPER ALLOY HAVING EXCELLENT CORROSION
: CRACKING RESISTANCE AND DEZINCING RESISTANCE,
: AND METHOD FOR PRODUCING SAME

DECLARATION PURSUANT TO 37 C.F.R. 1.132

I, Yoshinori Yamagishi, a citizen of Japan, residing at 9444, Kamakazu, Asahi-shi, Chiba 289-2505, Japan, hereby declare that I am one of the inventors named in the above-identified U.S. Patent Application, that I was graduated from Tohoku University, Faculty of Engineering, Department of Material Engineering, in March 1991, and that, since April 1991, I have been employed by Dowa Mining Co., Ltd.. Since April 1991, I have worked as a researcher in Central Laboratory of Dowa Mining Co., Ltd., and I have been engaged in research and development of metals, especially copper alloys.

I understand that the above application has been rejected over JP60194035. In order to show that the differences between the subject matter of JP60194035 and the subject matter of the application, the following experiment was undertaken by me and/or those under my direction.

EXPERIMENT

Raw materials of components in each of Examples 1 through 20 and Comparative Examples 1 through 5 shown in Table 1 of the specification were mixed to be melted in an induction furnace to be semi-continuously cast to form a bar having a diameter of 80 mm. Then, the bar was hot-extruded so as to have a diameter of 30 mm, and cold-drawn so as to have a diameter of 29.5 mm. Thereafter, in each example, the bar was heat-treated on heat treatment conditions shown in Table 2 of the specification, and the cooling rate was in the range of from 0.2 to 10℃/sec.

In order to evaluate the stress corrosion cracking resistance, each of the samples before cold drawing was cut into pieces having a thickness of 1.5 mm to be hot-rolled so as to have a thickness of about 0.5 mm, and the surface thereof was cold-rolled by about 0.03 mm. Thereafter, a heat treatment was carried out, so that a sample having a thickness of 0.5 mm, a width of 10 mm and a length of 140 mm was prepared. Then, a stress being 50 % of the proof stress was applied to each of the samples by the two-point load method based on JIS H8711, and each of the samples was held in a desiccator including 14 % NH_3. In this state, the time required to cause stress corrosion cracking was measured. The results are shown in the following table and the attached figure.

	Si(% by weight)	Broken Time(h)
Comp. Example 1	0.00	4.5
Comp. Example 2	0.00	3
Comp. Example 3	0.00	3.5
Comp. Example 4	0.02	8
Comp. Example 5	0.04	12
Example 1	0.02	15
Example 2	0.12	23
Example 3	0.03	16
Example 4	0.05	20
Example 5	0.11	17
Example 6	0.04	18
Example 7	0.05	16
Example 8	0.10	20
Example 9	0.10	17
Example 10	0.20	26
Example 11	0.10	18
Example 12	0.20	24
Example 13	0.11	16
Example 14	0.05	16
Example 15	0.34	32
Example 16	0.09	17
Example 17	0.02	15
Example 18	0.10	20
Example 19	0.03	17
Example 20	0.12	22

From Experiment, it can be clearly seen that the broken time of a copper alloy is increased, i.e., the stress corrosion cracking resistance of a copper alloy is improved, as the amount of silicon contained in the copper alloy is increased. In particular, when a copper alloy contains 0.01 to 0.5 % by weight of silicon, the copper alloy has an excellent stress corrosion cracking resistance as can be seen clearly from Experiment.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: February 19, 2007

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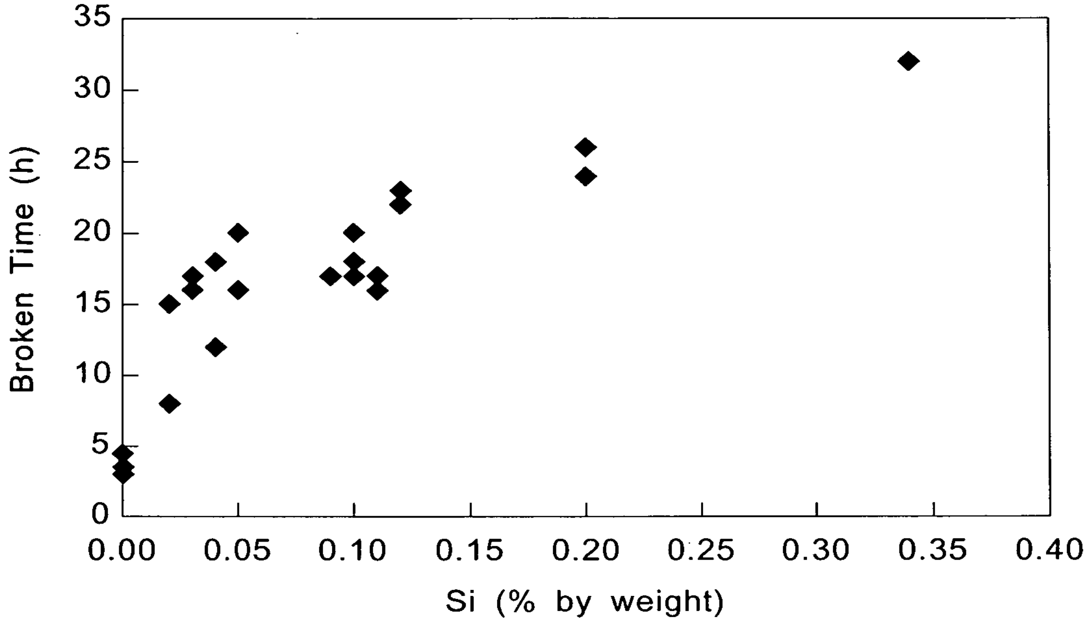
FIGURE


35
30
25
20
15
10
5
0
Broken Time (h)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Si (% by weight)